Your Guide to Removing Swimming Pool Stains

By Bruce K. Bernard, PhD

The swimmers at the summer games inspired awe in all who viewed those exciting events, including the littlest backyard pool athlete who has dreams of winning gold. Recently, the sparkling blue of the dive pool in Rio was transformed into a deep green, sparking fears of algae. In fact, the color change was blamed on a decline in alkalinity, caused by insufficient levels of chemicals that buffer pool water pH. A significant drop in pH can make the water corrosive to metal fixtures and equipment, which could cause metal leaching and discoloration of the water.

If you are maintaining a backyard pool for your family, you may be wondering about the appearance of stains in your pool – not only in the water, but on pool surfaces. What causes them and how should they be treated? A recent article[1] by Terry Arko in The IPSSAN (The Independent Pool & Spa Service Association, Inc., July, 2016) newsletter provides many helpful answers.

As Arko notes, "Not all stains are the same, so it's important to diagnose the stain before providing a broad-spectrum treatment." Arko also makes the point that when addressing a pool stain, the first thing to do is to ensure the water chemistry is balanced. He notes, "A lot of staining in pools is from the pH dropping down and aggressively dissolving the metals into solution." Regarding pool surfaces, vinyl and fiberglass pools usually respond better to stain treatment than plaster pools, which are more porous. The quality of paint on plaster, concrete or cement plastered pools also affects how easily stains are removed. Arko recommends brushing pool walls regularly and adding a sequestering agent (to prevent metal staining) at a frequency (e.g., weekly, biweekly, or monthly) that fits your needs.

The table below is based on Arko's recommendations for specific pool stain removal:

Stain Color	Likely Source	Treatment	Notes
Blue-green stain on pool surfaces or in water (but water is not cloudy)	Copper from algaecides, heat exchangers, fill water, older copper plumbing	Granular treatments, such as citric acid and ascorbic acid used directly on the stain; an	If water is blue-green ***and also cloudy***, the likely source of the stain is algae, in which case

[1] "Pool staining—identify before you treat," by Terry Arko, The IPSSAN, July, 2016, p. 9, 13, and 17.

		additional sequestering agent can help the filtration system trap removed metals. If treatment includes phosphoric and/or phosphonic acid, these must be removed at a later time. Generally, non-phosphate treatments are only effective on stains that have not yet set into the surface.	an algaecide is needed; algae will also be evident by slimy walls and floor. In the Rio dive pool example, the alkalinity of the pool water had to be restored with chemicals such as sodium bicarbonate and sodium carbonate.
Purple precipitate on pool water surface, tile line, skimmers and pool cleaner	Copper cyanurate when the cyanuric acid level is over 100 ppm	Reduce cyanuric acid level to about 50 ppm by draining water.	Draining water also addresses copper in the water, but it is important to test the water for any remaining copper.
Brown stain on pool surfaces or in water	The most common source is well water that contains dissolved iron or manganese; other potential sources are pool heater headers or lawn fertilizers	Same as for copper; if the source of iron is well water, begin a maintenance program of adding a sequestering agent weekly; use a non-phosphate sequestering agent to preclude elevating phosphate levels.	
Brown stains, some of which may be shaped like leaves and other organic debris	Leaves and other natural materials that settle to the pool bottom; often found after uncovering the pool at the start of pool season	Stains may disappear as pool chlorine levels are established or shock treatment is applied; alternatively, citric acid or ascorbic acid work well to lift these stains.	
Metal corrosion	Salt generators corrode metals, such as pool ladders and light rings	Add a sacrificial anode, such as zinc; use a non-phosphate sequestering agent.	

Bruce Bernard, PhD, is President of SRA Consulting, Inc., and Associate Editor of the International Journal of Toxicology, and lives in Cambridge, MD.